

# WHAT IS CLAIMED IS:

1. A data converter for converting print data transmitted from a printing control unit to a printing unit via a serial bus, the apparatus comprising:

a judging means for detecting print data specifying information included in a print data transmitting command supplied from the printing control unit, and judging, based on the detected print data specifying information, the type of the print data transmitted from the printing control unit; and

a conversion controlling means for converting, according to the result of the judgment made by the judging means, the print data transmitted from the printing control unit to the printing unit to print data of a type supported by the printing unit, and outputting the converted print data to the printing unit.

2. The data converter according to claim 1, wherein the serial bus is a one conforming to the IEEE (Institute of Electrical and Electronics Engineers) 1394 standard.

3. The data converter according to claim 1, wherein the judging means judges based on the print data specifying information the type of the page-description language of the print data; and

the conversion controlling means converts, according to the result of the judgment made by the judging means, the print data transmitted from the printing control unit to print data in a type of page-description language supported by the printing unit.

4. The data converter according to claim 3, wherein the judging means judges, based on the print data specifying information, whether the print data transmitted from the printing control unit is video data or data described in a page-description language; and

when the print data transmitted from the printing control unit has been judged to be video data, the conversion controlling means outputs the video data as it is to the printing unit, while when the print data transmitted from the printing control unit has been judged to be data described in a page-description language, the conversion controlling means converts the print data transmitted from the printing control unit to print data in a type of page-description language supported by the printing unit.

5. A data converting method for converting print data transmitted from a printing control unit to a printing unit via a serial bus, the method comprising:

a first step of inputting, from the printing control unit, a print data transmitting command informing that the print data is going to be transmitted from the printing control unit to the printing unit;

a second step of detecting print data specifying information included in the supplied print data transmitting command;

a third step of judging, based on detected print data specifying information, the type of the print data transmitted from the printing control unit;

a fourth step of converting, according to the result of the judgment effected in the third step, the print data transmitted from the printing control unit to print data of

a type supported by the printing unit; and

a fifth step of outputting the converted print data to the printing unit.

6. The data converting method according to claim 5, wherein the serial bus is a one conforming to the IEEE 1394 standard.

7. The data converting method according to claim 5, wherein the type of the print data in the third step is a type of page-description language of the print data; and

the print data of the type supported by the printing unit in the fourth step is print data in a type of page-description language supported by the printing unit.

8. The data converting method according to claim 7, further comprising steps of:  
judging, based on the print data specifying information, whether the print data transmitted from the printing control unit is video data or data described in a page-description language; and

outputting the print data transmitted from the printing control unit, having been judged to be video data, as it is to the printing unit, while converting the print data transmitted from the printing control unit, having been judged to be data described in a page-description language, to print data in a type of page-description language supported by the printing unit.

9. A printer comprising:

a printing means for making a printing work by the use of print data;

an input/output means to which the print data and a control command are supplied from a printing control unit via a serial bus;

a judging means for detecting print data specifying information included in a print data transmitting command supplied to the input/output means and judging, based on the detected print data specifying information, the type of the print data transmitted from the printing control unit;

means for converting, according to the result of the judgment, the supplied print data to print data of a type supported by the printing means; and

means for controlling the printing means to make a printing work by the use of the converted print data from the converting means.

10. The printer according to claim 9, wherein the serial bus is a one conforming to the IEEE (Institute of Electrical and Electronics Engineers) 1394 standard.

11. The printer according to claim 9, wherein the judging means judges based on the print data specifying information the type of the page-description language of the print data.

12. The printer according to claim 11, wherein the judging means judges, based on the print data specifying information, whether the print data transmitted from the printing control unit is video data or data described in a page-description language; and

when the print data transmitted from the printing control unit has been judged to be video data, the conversion controlling means outputs the video data as it is to the printing unit, while when the print data transmitted from the printing control unit has been judged to be data described in a page-description language, the conversion controlling means converts the print data transmitted from the printing control unit to

print data in a type of page-description language supported by the printing unit.

13. A printing method comprising:

a first step of detecting print data specifying information included in a print data transmitting command transmitted from a printing control unit via a serial bus and judging, based on the detected print data specifying information, the type of the print data transmitted from the printing control unit;

a second step of inputting the print data from the printing control unit via the serial bus and converting, according to the result of the judgment, the supplied print data to print data of a type supported by a printing unit; and

a third step of making a printing work by the printing unit by the use of the converted print data.

14. The printing method according to claim 13, wherein the serial bus is a one conforming to the IEEE 1394 standard.

15. The printing method according to claim 13, wherein the type of the print data in the third step is a type of page-description language of the print data; and

the print data of the type supported by the printing unit in the fourth step is print data in a type of page-description language supported by the printing unit.

16. The printing method according to claim 15, further comprising steps of:

judging, based on the print data specifying information, whether the print data transmitted from the printing control unit is video data or data described in a page-description language; and

outputting the print data transmitted from the printing control unit, having been judged to be video data, as it is to the printing unit, while converting the print data transmitted from the printing control unit, having been judged to be data described in a page-description language, to print data in a type of page-description language supported by the printing unit.

17. A printing control unit including according to the present invention:

means for generating print data for use by a printing unit connected via a serial bus to make a printing work;

an input/output means for outputting a control command to control the printing unit and the print data to the printing unit via the serial bus;

means for generating a print data transmitting command including print data specifying information indicative of the type of the print data transmitted to the printing unit; and

means for controlling the input/output means to output to the printing unit print data of a type indicated by the print data specifying information included in the print data transmitting command generated by the command generating means.

18. The printing control unit according to claim 17, wherein the serial bus is a one conforming to the IEEE 1394 standard.

19. The printing control unit according to claim 17, wherein the command generating means generates a print data transmitting command including print data specifying information for use to identify the type of a page-description language

corresponding to a manufacturer of the printing unit.

20. The printing control unit according to claim 17, wherein the command generating means generates a print data transmitting command including print data specifying information for use to identify the type of a page-description language corresponding to a type of the printing unit.

21. The printing control unit according to claim 17, wherein the command generating means generates a print data transmitting command including print data specifying information for use to judge whether the print data transmitted to the printing unit is video data or data described in a page-description language.

22. A printing controlling method in which data to be printed by a printing unit connected via a serial bus is outputted to the printing unit which is thus allowed to make a printing work, the method comprising:

a first step of generating a print data transmitting command including print data specifying information indicative of the type of the print data transmitted to the printing unit and outputting it to the printing unit; and

a second step of transmitting, to the printing unit, print data of a type indicated by the print data specifying included in the print data transmitting command.

23. The printing controlling method according to claim 22, wherein the serial bus is a one conforming to the IEEE 1394 standard.

24. The printing controlling method according to claim 22, wherein the print data specifying information indicative of the type of print data in the first step is print data

specifying information for use to identify the type of a page-description language corresponding to a manufacturer of the printing unit.

25. The printing controlling method according to claim 22, further comprising a step of:

generating a print data transmitting command including print data specifying information for use to identify the type of a page-description language corresponding to the type of the printing unit.

26. The printing controlling method according to claim 22, further comprising a step of:

generating a print data transmitting command including print data specifying information for use to judge whether the print data outputted to the printing unit is data described in a page-description language or video data.

27. A printing system comprising:

a printing control unit including:

means for generating data to be printed by a printing unit connected via a serial bus;

a first input/output means for outputting a control command to control the printing unit and the print data to the printing unit via the serial bus; and

means for generating a print data transmitting command including print data specifying information indicative of the type of the print data transmitted to the printing unit;



the printing unit including:

a second input/output supplied with the print data and control command from the printing control unit; and

means for making a printing work by the use of the print data supplied from the printing control unit via the second input/output means;

the printing control unit controlling the first input/output means to output to the printing unit the print data transmitting command generated by the command generating means;

the printing unit detecting the print data specifying information included in the print data transmitting command supplied from the second input/output means via the serial bus, judging, based on the detected print data specifying information, the type of the print data transmitted from the printing control unit, and converting, according to the result of the judgment, the print data transmitted from the printing control unit to print data of a type supported by the printing means.

28. A printing method in which print data is transmitted via a serial bus from a printing control unit to a printing unit which is thus allowed to print the print data, the method comprising the steps of:

generating a print data transmitting command including print data specifying information indicative of the type of the print data and outputting it from the printing control unit to the printing unit;

detecting the print data specifying information included in the print data

transmitting command transmitted from the printing control unit to the printing unit and judging the type of the print data transmitted from the printing control unit;

inputting the print data transmitted from the printing control unit via the serial bus to the printing unit;

converting, according to the result of the judgment, the supplied print data to print data of a type supported by the printing unit; and

making a printing work at the printing unit by the use of the converted print data.

29. A printing system comprising:

a printing control unit including:

means for generating data to be printed by a printing unit connected via a serial bus;

a first input/output means for outputting a control command to control the printing unit which makes a printing work by the use of the print data generated by the print data generating means, and the print data to the printing unit; and

means for generating a print data transmitting command including print data specifying information indicative of the type of the print data transmitted to the printing unit; and

the printing unit including:

a second input/output means connected to the serial bus and to which the print data and control command are supplied from the printing control unit; and

means for making a printing work by the use of the print data supplied from the printing control unit via the second input/output means;

the printing control unit controlling the first input/output means to transmit the print data transmitting command generated by the command generating means to the printing unit;

the printing unit judging the type of the print data indicated by the print data specifying information included in the print data transmitting command; and outputting to the printing control unit the result of the judgment indicating whether the type of the print data, indicated by the print data specifying information, is supported by the printing means for making a printing work; and

the printing control unit outputting, based on the result of the judgment from the printing unit, print data of a type supported by the printing means to the printing unit.

30. A printing method in which print data is transmitted from a printing control unit to a printing unit via a serial bus and printed by the printing unit, the method comprising the steps of:

generating a print data transmitting command including print data specifying information indicative of the type of the print data and outputting it from the printing control unit to the printing unit;

detecting the print data specifying information included in the print data transmitting command transmitted from the printing control unit to the printing unit;

judging the type of the print data transmitted from the printing control unit;  
outputting the result of the judgment, indicating whether the type of the print data, indicated by the print data specifying information, is supported by the printing unit; and

outputting print data of a type supported by the printing unit from the printing control unit to the printing unit.

31. A printing system comprising:

a printing control unit including:

a print data generating means for generating data to be printed by a printing unit connected to the print data generating means via a serial bus;

a first input/output means outputting a control command to control the printing unit which makes a printing work by the use of the print data generated by the print data generating means, and the print data to the printing unit; and

means for generating a print data transmitting command including print data specifying information indicative of the type of the print data; and

a data converting block including:

means for detecting the print data specifying information included in the print data transmitting command supplied from the printing control unit and judging, based on the detected print data specifying information, the type of the print data transmitted from the printing control unit;

means for converting, according to the result of the judgment by the

judging means, the print data transmitted from the printing control unit to print data of a type supported by the printing unit, and outputting the converted print data to the printing unit; and

the printing unit including:

a third input/output means supplied with the converted print data and print data transmitting command from the data converting block; and

means for making a printing work by the use of the converted print data supplied from the third input/output means.

32. A printing method in which print data is transmitted from a printing control unit to a printing unit via a serial bus for printing by the printing unit, the method comprising the steps of:

generating a print data transmitting command including print data specifying information indicative of the type of the print data and outputting the command from the printing control unit to a data converting block;

detecting the print data specifying information included in the print data transmitting command transmitted from the printing control unit to the data converting block;

judging the type of the print data transmitted from the printing control unit;

transmitting the print data from the printing control unit to the data converting block;

converting, according to the result of the judgment, the supplied print data to

print data of a type supported by the printing unit;

outputting the converted print data from the data converting block to the printing unit; and

making a printing work at the printing unit by the use of the converted print data from the data converting block.

33. A data transmitting method in which print data is transmitted from a printing control unit to a printing unit via a serial bus, the method comprising steps of:

generating, at the printing control unit, a print data transmitting command including print data specifying information indicative of the type of the print data and transmitting the command from the printing control unit to the printing unit;

judging, at the printing control unit, whether the print data of the type indicated by the print data specifying information can be printed or not, based on the response of the printing unit to the print data transmitting command; and

deciding, at the printing control unit, when it has been judged that the print data of the type designated with the initially designated print data specifying information cannot be printed, to include, into the data transmitting command, print data identification information different from the initially designated one and output the different data transmitting command again to the printing unit, or

deciding, when it has been judged that the print data of the type designated with the initially designated print data specifying information can be printed, to transmit the print data of the designated type to the printing unit.